

Controlled Flight Into Terrain

CW4 R. SCOTT HANDLON

Directorate of Evaluation and Standardization

Fort Rucker, Ala.

Before the start of Operations Enduring and Iraqi Freedom, the tactics a generation of attack helicopter pilots used to engage the enemy was a very static event. The aircraft entered an attack-by-fire position, engaged targets at a distance while hovering with an occasional position change and then departed the battle area to rearm and refuel.

Since 2001, we've had to relearn the tactics used during the Vietnam War. These methods involve a more dynamic flight technique than merely hovering and shooting, but the change has come at a cost. Over the past 20 months, the AH-64 community has experienced a dramatic increase in controlled flight into terrain accidents, resulting in five destroyed aircraft and five dead aviators. All these accidents occurred while the crews were conducting either running and diving fire or combat maneuvering flight. In three accidents, both crewmembers had focused their attention inside the cockpit until the aircraft descended below a recoverable altitude or contacted the ground without a recovery initiated.

The Army isn't alone; our sister services regularly perform running and diving fire and have had their share of CFIT accidents. These services have developed tactics, techniques and procedures to help mitigate the risk and include them in their training publications and local standing operating procedures. The Army uses its current aircrew training manuals as a means to address flight techniques, and many tasks reflect measures that mitigate the CFIT risk.

One such procedure is reflected in Task 1422: Perform Firing Techniques. The task description explains the three levels of AH-64 safing: releasing the weapons trigger, deselecting the weapon by the weapons action switch and selecting SAFE on the master arm switch/button. Any one of these actions will prevent the weapons system from firing, and only one of these, selecting SAFE, requires a crewmember to look inside the cockpit (preferably the pilot not on the controls).

These countermeasures were added to Training Circulars 1-251 and 1-238 after a CFIT accident killed one pilot and permanently disabled the other. In this accident, the pilot on the controls directed his attention inside the aircraft to toggle the master arm button to SAFE while coming off a running fire engagement. The co-pilot gunner continued to engage targets with the target acquisition designation sight, and within three seconds the aircraft descended to the ground.

Unfortunately, this same accident occurred yet again a short time later. As in the crash mentioned above, instead of flying the aircraft, the crew directed their attention inside the cockpit to safe the aircraft or perform other actions during a diving fire recovery. Although their intentions were good, this act distracted the crew long enough that the aircraft descended below a recoverable altitude. Both crewmembers were killed.

Another process used to mitigate CFIT can be found in Task 1415: Perform Diving Flight. In this task, the pilot on the controls must remain focused outside the aircraft and clear it throughout the maneuver, which includes the recovery. The pilot not on the controls must provide adequate warning to avoid traffic or obstacles (i.e., the ground) and announce when he's focusing his attention inside the cockpit. The crew also must recover the aircraft by either velocity, not to exceed 500 feet above ground level, whichever comes first.

One item both these tasks lack is a control when the crew fails to follow the procedure due to human error. This control will be included in Change 1 of the AH-64 ATM. The procedure is a no-brainer and easy to perform. Before entering into running and diving or combat maneuvering flight, set the low altitude warning on the radar altimeter to your recovery altitude, taking into account any lag in the system (10 percent higher than the actual altitude for Longbow drivers). If the low altitude warning audio sounds or "LO" appears in the helmet display unit under the radar altimeter readout, the aircrew will give their sole attention to placing the aircraft back above the minimum altitude.

The pilot on the controls will ensure the aircraft's nose is placed equal to or above the horizon before adding power (somewhere around max continuous torque available) to preclude accelerating, descending flight. There will be no tactical play, radio or nonessential intercommunication system transmissions until the pilot on the controls states "back above" to the pilot not on the controls. This procedure works well for our sister services and should work for us. Remember, however, this procedure is used when the crew fails to perform the task to standard. If done properly, the low altitude warning should never sound and LO should not appear in the HDU.

The Combat Maneuvering Flight Handbook explains that the crew should always leave a way out. No



one flies all maneuvers flawlessly every time, so give yourself a buffer. If you're performing CMF, complete the maneuver before slowing below minimum or going above maximum maneuvering airspeed, also known as bucket speed. If your bucket is 1 knot airspeed, as it will be in places like Afghanistan and Iraq in the summer, complete the maneuver before reaching that speed. The bucket is also a good indicator of how much maneuvering you can perform in given environmental conditions.

Although the CMF airworthiness release extends the performance envelope to +/- 120 degrees of bank and +/- 60 degrees of pitch, this increase in the max allowable maneuvering range was included so the operator wouldn't exceed a limit while performing these maneuvers and doesn't reflect actual environmental limitations. If your bucket speed is 1 knot, the maneuver might have to remain within the -10 maneuvering limits. Also, give yourself enough altitude to complete the recovery. The altitude standard for most maneuvers in the ATM is +/-100 feet, and these are much more mundane than CMF.

A pitch back turn might go badly if you end up 60 degrees nose down at only 190 feet AGL, as a unit in Afghanistan recently discovered. Don't perform a break turn at 98 percent torque, 140 knots true airspeed and 200 feet AGL. You have no excess power available and minimum altitude to lose, and the maneuver is designed to trade altitude for airspeed and transition from level to diving flight. Your available energy states—altitude, airspeed and excess power available—aren't going to help, and you'll probably end up hurting the aircraft or yourself.

The flight regime we're operating in and the TTPs we use aren't dangerous, but they are unforgiving. Controls are in place to keep our aircrews safe yet able to perform their missions if done properly. Deviating from the standards, including not flying the aircraft, directing attention inside the aircraft when it should be outside and performing maneuvers at altitudes or airspeeds that don't allow complete recovery before ground contact, is costing the Army its aviators and equipment. Every aircraft we crash is doing the enemy's job for them, and they don't even have to fire a shot. Keep your head in the game, look outside the aircraft and give yourself an out to prevent future CFIT accidents and stay in the fight!